mm [1½ in] diameter holes drilled perpendicular to traffic, one hole centered at 100 mm [4 in] above ground level and one centered at 460 mm [18 in] above ground level (posts shall be installed with the 150 mm [6 in] length parallel to the roadway); 150 mm by 150 mm [6 in by 6 in] posts shall have two 50 mm [2 in] diameter holes drilled perpendicular to traffic, one hole centered at 100 mm [4 in] above ground level and one centered at 460 mm [18 in] above ground level; 100 mm by 100 mm [4 in by 4 in] posts need not be modified.

When pressure treated wood sign posts are called for on the plans, the wood shall be Yellow Pine, Number 2 or better, .40 CCA, D4 S. The pressure treated wood shall meet AWPA Standard P-5 or Federal Standard TT-W-550. The treating process shall meet Federal Specification TT-W-571, or AWPA Commodity Standards as applicable.

SECTION 721 - BREAKAWAY DEVICES

721.01 Breakaway Devices Breakaway devices shall be capable of supporting all design loads and shall conform in all respects to the requirements of the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals" and all applicable commentary. Breakaway Support Certification of both breakaway and structural adequacy shall be provided by the Manufacturer. Design calculations or test data of production samples to support certification shall be provided. Breakaway support components shall provide the same or greater structural strength as the support post or pole utilizing the breakaway device.

SECTION 722 - GEOTEXTILES

722.01 Stabilization/Reinforcement Geotextile The geotextile shall have property values expressed as Minimum Average Roll Value (MARV) in the weakest principal direction, which meet or exceed the values stated below. Sampling and conformance testing shall be in accordance with ASTM D4354. Geotextile product acceptance shall be based on ASTM D4759. Geotextile Storage and Handling requirements shall be based on ASTM D4873.

Woven and non-woven geotextiles are acceptable and must meet the following requirements:

Mechanical Property	Test Method[1]	MARV[2]	
		Elongation[3]	
		< 50%	≥ 50%
Grab Strength - N [lb]	D4632	1400 [315]	900 [202]
Sewn Seam Strength - N [lb]	D4632	1260 [283]	810 [182]
Tear Strength - N [lb]	D4533	500 [112]	350 [79]
Puncture Strength - N [lb]	D4833	500 [112]	350 [79]
Other Properties	Test Method[1]	Requirements	
Permittivity	D4491	0.05/sec[4]	
Apparent Opening Size (AOS)	D4751	0.43 mm [0.017 in] (maximum)[5]	
Ultraviolet Stability (Retained Strength)	D4355	50% after 500 hours of exposure	
Other Requirements	Test Method[1]		
Conformance	D4759		
Sampling for Testing	D4354		
Storage and Handling	D4873		

[1]ASTM test method unless otherwise noted.

[2]Minimum Average Roll Value (MARV) unless otherwise noted.

[3]As determined in accordance with ASTM D4632.

[4]Permittivity of the geotextile should be greater than that of the soil. The Resident may also require the permeability of the geotextile to be greater than that of the soil.

[5]Maximum average roll value.

722.02 Drainage Geotextile The geotextile shall have property values expressed as Minimum Average Roll Value (MARV) in the weakest principal direction, which meet or exceed the values stated below. Sampling and conformance testing shall be in accordance with ASTM D4354. Geotextile product acceptance shall be based on ASTM D4759. Geotextile Storage and Handling requirements shall be based on ASTM D4873.

Both woven and nonwoven geotextiles are acceptable, however, no "slit-film" woven

fabrics will be permitted. The geotextile must meet the following requirements:

Mechanical Property	Test Method[1]	MARV[2]	
		Elongation[3]	
		< 50%	≥ 50%
Grab Strength - N [lb]	D4632	1100 [247]	700 [157]
Sewn Seam Strength - N [lb]	D4632	990 [223]	630 [142]
Tear Strength - N [lb]	D4533	400 [90][4]	250 [56]
Puncture Strength - N [lb]	D4833	400 [90]	250 [56]

Other Properties	Test Method[1]	Requirements Percent In-Situ Soil Passing 0.075 mm[5] [0.003 in]		
		<15	15 to 50	>50
Permittivity	D4491	0.5/sec	0.2/sec	0.1/sec
Apparent Opening Size (AOS)[6] mm [in]	D4751	0.43 mm [0.017]	0.25 mm [0.010]	0.22 mm[7] [0.0087]
Ultraviolet Stability (Retained Strength)	D4355	50% after 500 hours of exposure		

Other Requirements	Test Method[1]
Conformance	D4759
Sampling for Testing	D4354
Storage and Handling	D4873

[1]ASTM test method, unless otherwise noted.

[2]Minimum Average Roll Value (MARV) unless otherwise noted.

[3]As determined in accordance with ASTM D4632.

[4]The required MARV tear strength for woven monofilament geotextiles is 250 N [56 lb].

[5]Based on grain size analysis of in situ soil in accordance with AASHTO T88.

[6]Maximum average roll value.

[7]For cohesive soils with a plasticity index greater than 7, geotextile maximum average roll value for apparent opening size is 0.30 mm [0.012 in].

722.03 Erosion Control Geotextile The geotextile shall have property values expressed

as Minimum Average Roll Value (MARV) in the weakest principal direction, which meet or exceed the values stated below. Sampling and conformance testing shall be in accordance with ASTM D4354. Geotextile product acceptance shall be based on ASTM D4759. Geotextile Storage and Handling requirements shall be based on ASTM D4873.

Both woven and non-woven geotextiles are acceptable, however, no "slit-film" woven fabrics will be permitted.

Woven Monofilament Erosion Control Geotextiles require Class 2 geotextile class designation. All other Erosion Control Geotextiles require Class 1 geotextile class designation.

The Erosion Control Geotextile class selection is appropriate for conditions of equal or less severity than either of the following:

a. Armor layer stone weights do not exceed 100 kg [220 lb], stone drop height is less than 1 m [3 ft], and no aggregate bedding layer is required.

b. Armor layer stone weighs more than 100 kg [220 lb], stone drop height is less than 1 m [3 ft], and the geotextile is protected by a 150 mm [6 in] thick aggregate bedding layer designed to be compatible with the armor layer. More severe applications require an assessment of geotextile survivability based on a field trial section and may require a geotextile of higher strength properties.

The Resident may specify a Class 2 geotextile based on one or more of the following:

a. The Resident has found Class 2 geotextiles to have sufficient survivability based on field performance of the geotextile.

b. The Resident has found Class 2 geotextiles to have sufficient survivability based on laboratory testing and visual inspection of a geotextile sample removed from a field test section constructed under anticipated field conditions.

c. Armor layer stone weighs less than 100 kg [220 lb], stone drop height is less than 1 m [3 ft], and the geotextile is protected by a 150 mm [6 in] thick aggregate bedding layer designed to be compatible with the armor layer.

d. Armor layer stone weights do not exceed 100 kg [220 lb] and stone is placed with a zero drop height.

The Class 2 geotextile must meet the requirements for drainage geotextile, except for the following:

Other Properties	Test Method	Requirements Percent In-Situ Soil Passing 0.075 mm [0.003 in]		
		<15	15 to 50	>50
Permittivity	D4491	0.7/sec	0.2/sec	0.1/sec

All other Erosion Control Geotextile applications that exceed the woven monofilament Erosion Control geotextile Class 2 criteria defined above require Class 1 geotextile class designation. The Class 1 geotextile must meet the requirements for Class 2 geotextile, except for the following:

Mechanical Property	Test Method	MARV	
		Elongation	
		< 50%	≥ 50%
Grab Strength - N [lb]	D4632	1400 [315]	900 [202]
Sewn Seam Strength - N [lb]	D4632	1260 [283]	810 [182]
Tear Strength - N [lb]	D4533	500 [112]	350 [79]
Puncture Strength - N [lb]	D4833	500 [112]	350 [79]

722.04 Separation Geotextile The geotextile shall have property values expressed as Minimum Average Roll Value (MARV) in the weakest principal direction, which meet or exceed the values stated below. Sampling and conformance testing shall be in accordance with ASTM D4354. Geotextile product acceptance shall be based on ASTM D4759. Geotextile Storage and Handling requirements shall be based on ASTM D4873.

Both woven and non-woven geotextiles are acceptable. The geotextile must meet the requirements of drainage geotextile, except for the following:

Other Properties	Test Method[1]	Requirements
Permittivity	D4491	0.02/sec
Apparent Opening Size (AOS)	D4751	0.60 mm [0.024 in](maximum)